

### **Amendments to the Claims**

This listing of claims will replace all prior versions, and listings, of the claims in the application:

#### **Listing of Claims:**

Claims 1-55 (Cancelled)

56. (Previously Presented) An atomic layer deposition (ALD) apparatus, comprising  
a first gas flow pathway coupled upstream of a reaction chamber and having switchable first and third flow limiting conductances such that during an expose period of an ALD process the first gas flow pathway is operable to provide a first flow from a first pressure source to the reaction chamber and during a reactant removal purge period of the ALD process the first gas flow pathway is operable to provide a second flow from a second pressure source to the reaction chamber, the second pressure source having a greater pressure than the first pressure source; and

a second gas flow pathway coupled downstream of the reaction chamber and having switchable second and fourth flow limiting conductances, a ratio of the first flow limiting conductance to the second flow limiting conductance being nominally equal to a ratio of the third flow limiting conductance to the fourth flow limiting conductance, configured such that during the ALD process a nominally constant pressure in the reaction chamber can be maintained.

57. (Previously Presented) The ALD apparatus of claim 56, wherein the first gas flow pathway is configured to provide a first gas for the first flow different from a second gas for the second flow.

58. (Previously Presented) The ALD apparatus of claim 56, wherein the expose period comprises a plasma-assisted process.

59. (Previously Presented) The ALD apparatus of claim 56, wherein the first gas flow pathway is configured such that the first flow limiting conductance is switched to the third flow limiting conductance at a substantially coincident point in time as the first flow is switched to the second flow.

60. (Previously Presented) The ALD apparatus of claim 56, wherein the first gas flow pathway is configured so that the first flow is switchable to the second flow prior to completion of material deposition during the expose period.

61. (Previously Presented) The ALD apparatus of claim 56, wherein the second gas flow pathway is configured such that the second flow limiting conductance in the second gas flow pathway is switchable to the fourth flow limiting conductance at a different point in time than that at which the first flow is switched to the second flow.

62. (Previously Presented) An atomic layer deposition (ALD) system, comprising:

- a gas flow pathway coupled upstream of a reactor chamber through selectable upstream flow limiting conductances having two or more operational modes including a low flow mode and a high flow mode; and

- a pumping arrangement coupled downstream of the reactor chamber through selectable downstream flow limiting conductances having two or more operational modes including a low flow mode and a high flow mode,

- wherein the upstream flow limiting conductances and downstream flow limiting conductances are configured to switch operational modes in time-phase with one another.

63. (Previously Presented) The ALD apparatus of claim 62, wherein the upstream flow limiting conductances are configured to switch operational modes prior to the downstream flow limiting conductances switching operational modes.

64. (Previously Presented) The ALD apparatus of claim 62, wherein the downstream flow limiting conductances include a throttle valve.

65. (Previously Presented) The ALD apparatus of claim 64, wherein the throttle valve comprises an annular throttle valve located within the reactor chamber.

66. (Previously Presented) The ALD apparatus of claim 65, wherein the annular throttle valve includes multiple vanes, each having an axis therethrough.

67. (Previously Presented) The ALD apparatus of claim 65, wherein the annular throttle valve includes includes multiple blades arranged in an iris configuration.

68. (Previously Presented) The ALD apparatus of claim 65, wherein the annular throttle valve includes multiple blades, each having a number of holes therethrough, at least one of the blades being rotatable about an axis such that holes extending through the rotatable blade align with holes of at least one of the other blades to provide a passage through the annular throttle valve.

69. (Previously Presented) The ALD apparatus of claim 62, wherein the gas flow pathway comprises multiple gas flow pathways for purge gasses and chemical precursors which share one or more common inputs to the reactor chamber.

70. (Previously Presented) The ALD apparatus of claim 62, wherein the upstream flow limiting conductances and downstream flow limiting conductances are configured to switch operations modes according to a difference in residence times for passage of gas between (i) the upstream conductances and the reaction chamber, and (ii) the reaction chamber and the downstream conductances.

Claims 71-74 (Cancelled)